SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL℠ Company

Gregg D. Ander, FAIA
Chief Architect
phone (626) 633-7160
fax (6260 633-7195

October 21, 2002

Mr. Bill Pennington
California Energy Commission
1516 9th Street
Sacramento, CA 95814-5512

Dear Bill,

We have reviewed the "Gas Cooling Compliance Options for Residential and Non-Residential Buildings" prepared by South California Gas and Sempra Energy Company, dated August 12, 2002 and have the following comments.

Page 2, Par. 1:

Since most of the power plants in California are gas fired, it is not clear if the peak natural gas demand prices may change from winter to summer in the future. Are there any credible forecasts for gas demand projections and costs that could be implemented in a benefit cost analysis?

Page 3, Par. 4:

The report describes the benefits of gas cooling under special conditions, however it does not disclose characteristics, which may impact the benefit cost analysis for engine driven and direct-fired absorption chillers. This hardware requires separate chiller rooms from electric chillers, and the footprint is much larger than traditional electric chillers. The additional space and fire rated walls, which are required pursuant to the Universal Mechanical Code (UMC) Section 1106.7 should be factored into the benefit cost analysis. Additionally, the first cost of gas driven chillers and absorption chillers is much higher and these costs should also be reflected.

6042 N. Irwindale Avenue
Suite B
Irwindale, CA 91702

For a gas absorption chiller, the lower limit of the chilled water temperature is higher than the electric chiller. For this reason, absorption chillers cannot be applied to systems that require low temperature chilled water. Absorption chillers cannot take advantage of lower condenser water temperatures; typically absorption chillers operate at temperatures in the high 70's degree condenser water temperature range. If the condenser water temperature drops too low, the bromide solution will crystallize and destroy the chiller. In this case, absorption chillers are less efficient, as more heat has to be rejected to the outdoors. Also, these systems require larger cooling towers, condenser water piping, and condenser water pumps. All of these will increase the first cost of the cooling system and should be included in the economic analysis.

Page 5, Par. 3:

The report did not point out that it takes much longer to perform a major overhaul of a gas engine. This will affect the operation of the building and should be reflected in the O&M section of the economic analysis.

Page 5, Par 6:

In order to accurately access the cost effectiveness, life cycle analysis must be performed for various building types in various climatic zones.

Page 8, Par. 5:

There are limited sizes of absorption chillers available for residential applications. It may not be true that the next highest half-ton chiller over the highest hourly load will be available. One should select the next available chiller size over the designed peak-cooling load.

Page 9, Equation 1:

The capacity of an absorption chiller is a function of the chilled water temperature and the condenser water temperature (for water cooled), or the chilled water temperature and the outdoor dry bulb temperature (for air cooled). It should not be just a function of outdoor dry bulb temperature alone.

Page 9, Equation 3:

The performance of an absorption chiller is a function of the chilled water temperature and the condenser water temperature (for water cooled), or the chilled water temperature and the outdoor dry bulb temperature (for air cooled). It should not be just a function of the outdoor dry bulb temperature alone.

Page 15, Recommendations:

Any Energy Codes and Standards changes require being cost effective through life cycle cost analysis. No life cycle cost analyses has been conducted for the study. Only compliance margins on energy have been presented.

Page 19, Equation 3.1gc:

See comment for Page 9, Equation 1.

Page 19, Equation 3.4gc:

See comment for Page 9, Equation 3.

If you have any comments or questions please feel free to contact me at 626-633-7160 or Henry Lau at 626-633-7179.

Sincerely,

Gregg D. Ander, FAIA
Southern California Edison

Cc: Henry Lau, PhD, P.E., Southern California Edison (SCE)
R. Anthony Pierce, P.E., Southern California Edison (SCE)
Manual Alvarez, Southern California Edison (SCE)
Kurt Kaufman, San Diego Gas and Electric (SDG&E)
Charles Eley, FAIA, Eley and Associates
Randal Higa, P.E., Southern California Gas
Dave Springer, Davis Energy Group
Brian Alcorn, P.E., California Energy Commission (CEC)